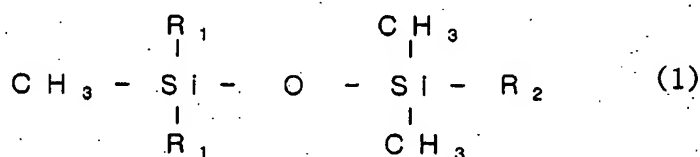


What is claimed is:

1. A silicone hyper-branched polymer surfactant prepared by polymerizing monomers represented by a chemical formula (1) and including a hydrophobic group and a hydrophilic group;



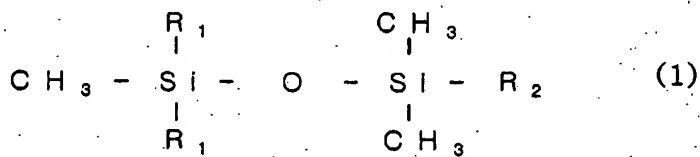
where R₁ denotes a vinyl group and R₂ denotes hydrogen.

2. The silicone hyper-branched polymer surfactant as claimed in claim 1, wherein siloxane of which a terminal is replaced with a carboxyl group, is a backbone of the silicone hyper-branched polymer surfactant.

3. A method of preparing a silicone hyper-branched polymer surfactant, comprising;

preparing dimethyl silanol by hydrolyzing dimethyl chlorosilane;

preparing a monomer represented by a chemical formula (1) of methyl divinyl siloxy dimethyl silane by reacting dimethyl silanol with divinyl methyl chlorosilane,



where R₁ denotes a vinyl group and R₂ denotes hydrogen; and

preparing hyper-branched polysiloxy silane by polymerizing the monomer.

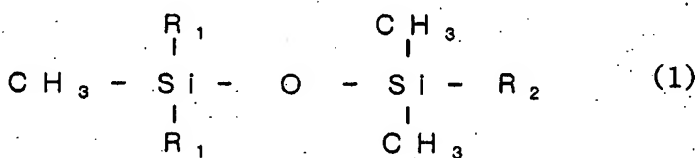
4. The method of claim 3, wherein the dimethyl silanol and divinyl chlorosilane are reacted with each other at about a 1:1 molar ratio.

5. The method of claim 3, wherein the monomer is polymerized by polymerizing the monomer using a catalyst and a hydrosilylation method, and replacing a terminal of the polymer with a carboxyl group.

6. The method of claim 5, wherein the catalyst includes platinum.

7. The method of claim 3, wherein the polymerizing is carried out using the R_1 and R_2 group of the monomer as reacting groups.

8. A rinsing solution comprising a silicone hyper-branched polymer surfactant prepared by polymerizing a monomer represented by a chemical formula (1) and de-ionized water, the surfactant including siloxane of which a terminal is replaced with a carboxyl group as a main backbone;



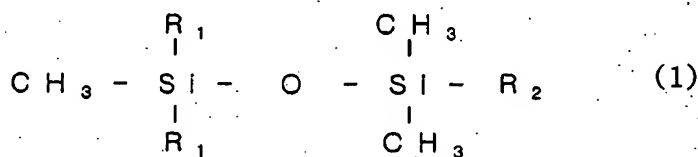
where R_1 denotes a vinyl group and R_2 denotes hydrogen.

9. A method of rinsing a semiconductor device comprising:

forming a photoresist pattern on a semiconductor substrate by selectively exposing a photoresist film and then developing the photoresist film to selectively

removing portions of the photoresist film;

providing a solution onto the photoresist pattern and the semiconductor substrate, where the solution includes (a) a silicone hyper-branched polymer surfactant which includes siloxane of which a terminal is replaced with a carboxyl group as a main backbone, the surfactant being prepared by polymerizing a monomer represented by a chemical formula (1) and (b) de-ionized water,



wherein, R_1 denotes a vinyl group and R_2 denotes hydrogen;

using the solution to separate a developing solution and photoresist residues which remain on the semiconductor substrate and the photoresist pattern from the semiconductor substrate and the photoresist pattern; and

removing the separated developing solution and the photoresist residues.